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Nonlinear Laser Filamentation Simulation in 3D* C. H. STILL, R. L. BERGER, A. B. LANGDON, L. V. POWERS, E. A. WILLIAMS, P. E. YOUNG, *Lawrence Livermore National Laboratory*
— Recent application of our laser filamentation code to high temperature hohlraums (*e.g.*, $I = 10^{16} W/cm^2, T_e = 10keV$), or channeling experiments where nearly all of the mass is evacuated from a cavity, have motivated the development, and integration into **F3d**, of a 3D nonlinear eulerian hydrodynamics (**Nh3**). We have also added a linearized nonlocal thermal heat conduction model, allowing simulation of thermally driven, as well as ponderomotively driven, filamentation, and a 2^{nd} order wave equation solver. The specifics of **Nh3** and some applications to beam deflection were reported last year. [1] In this presentation, we will show **F3d** simulations for high temperature hohlraums where the filamentation gain per speckle is large, when an extremely tight focus in a plasma is achieved (similar to Peter Young's experiments on Janus) [2] and in channeling experiments where near vacuum is achieved.

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[1]C. H. Still et al., "3D Nonlinear Hydrodynamics with Beam Deflection Applications", APS/DPP, Louisville KY, 6-11 November, 1995.
[2]P. E. Young et al., "Laser beam propagation and channel formation in underdense plasmas", Phys. of Plasmas, **2** 7 (1995).

Charles H. Still
bert@icf.llnl.gov
Lawrence Livermore National Laboratory

☐ Prefer Oral Session
☒ Prefer Poster Session

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